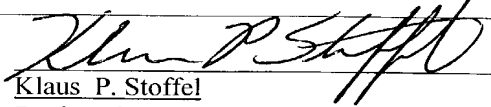


JC10 Rec'd PCT/PTO 11 JAN 2002

FORM PTO-1390 (REV 10-94)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		DOCKET #: 4598-59PUS
<p align="center">TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371</p>				
				<p align="center">U.S. APPLICATION NO. (If known, see 37 CFR 1.5)</p> <p align="center">10/030784</p>
INTERNATIONAL APPLICATION NO PCT/EP00/05821		INTERNATIONAL FILING DATE June 23, 2000		PRIORITY DATE CLAIMED July 16, 1999,
<p>TITLE OF INVENTION</p> <p align="center">Method For Detecting The State Of A Catalytic Converter System</p>				
<p>APPLICANT(S) FOR DO/EO/US</p> <p>Axel LANG; Axel WACHTENDORF; Uwe KAMMANN; Harald LOECK; Rudolf KREBS; Michael DAETZ; Frank Michael WITTIG; Axel KÖNIG;</p>				
<p>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371 <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> has been transmitted by the International Bureau. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US) <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)). <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). <input type="checkbox"/> have been transmitted by the International Bureau. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. <input type="checkbox"/> have not been made and will not be made. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). <input checked="" type="checkbox"/> An UNEXECUTED oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). <p>Items 11. to 16. Below concern other document(s) or information included:</p> <ol style="list-style-type: none"> <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. <input type="checkbox"/> A substitute specification. <input type="checkbox"/> A change of power of attorney and/or address letter. <input checked="" type="checkbox"/> Other items or information (<i>specify</i>): PCT Publication Sheet, Int'l Preliminary Examination Report, Int'l Search Report, PCT Request, Int'l. Prel. Search Report with Notification re Same 				

U.S. APPLICATION NO (if known, see 37 CFR 1.5) 10/030784		INTERNATIONAL APPLICATION NO PCT/EP00/05821		ATTORNEY'S DOCKET NUMBER 4598-59PUS	
17.[x]The following fees are submitted:					
Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO \$890.00 International preliminary examination fee paid to USPTO (37 CFR 1.482)..... \$710.00 No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$740.00 Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1040.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... \$100.00					
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$890	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
Claims	Number Filed	Number Extra	Rate		
Total Claims	11 - 20 =	0	x \$18.00	\$	
Independent Claims	1 - 3 =	0	x \$84.00	\$	
Multiple dependent claim(s) (if applicable)			+ \$280.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$890	
Reduction of 1/2 for filing by small entity, if applicable.				\$	
SUBTOTAL =				\$890	
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	
TOTAL NATIONAL FEE =				\$890	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by the appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	
TOTAL FEES ENCLOSED				\$890	
Amount to be refunded:				\$	
charged:				\$	
a. [x] One Credit Card Payment Form in the amount of \$ 890 to cover the above fee is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 03-2412 in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. [x] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 03-2412. A duplicate copy of this sheet is enclosed.					
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.					
SEND ALL CORRESPONDENCE TO: Klaus P. Stoffel Cohen, Pontani, Lieberman & Pavane 551 Fifth Avenue, Suite 1210 New York, New York 10176			 Klaus P. Stoffel Registration Number: 31,668 January 11, 2002 Tel: (212) 687-2770		

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531 Rec'd PCT/5... 11 JAN 2002

By Express Mail # EL 913696160 US · January 11, 2002

Attorney Docket # 4598-59PUS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re National Phase PCT Application of

Axel LANG et al.

International Appln. No.: PCT/EP00/05821

International Filing Date: June 23, 2000

For: Method For Detecting The State Of A Catalytic
Converter System

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231
BOX PCT

S I R:

Prior to the issuance of a first Office Action and simultaneously with the filing of
the present application, please amend said application as follows:

In the Specification:

Page 1, after line 1, insert --BACKGROUND OF THE INVENTION--.

the paragraph starting at line 2:

The invention pertains to a process for detecting the state of a catalyst system in an exhaust gas channel of an internal combustion engine of a motor vehicle.

Page 2, after line 12, insert --SUMMARY OF THE INVENTION--;

the paragraph starting at line 16:

This task is accomplished according to the invention by the process for detecting the state of the catalyst system in that:

(a) at least one operating parameter of the catalyst system is detected over a predetermined time period;

(b) the total energy output of the internal combustion engine within the predetermined time period is determined; and

(c) a characteristic value k is calculated on the basis of a ratio of the at least one operating parameter to the total energy output.

It is thus possible in an advantageous manner to take into account the dynamic behavior of the engine with respect to the emission of pollutants.

Page 3, the paragraph starting at line 19:

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In a preferred embodiment of the process, the state of the catalyst system is detected within an acceleration phase of the motor vehicle. In addition, the detection of the state can also be made to depend on whether or not the operating mode of the internal combustion engine is within a predetermined lambda region or on whether the catalyst temperature is in a predetermined temperature range.

delete lines 25 and 26;

after line 26, insert --BRIEF DESCRIPTION OF THE
DRAWINGS--;

the paragraph starting at line 27:

The invention is explained in greater detail below on the basis of the associated drawings:

— Figure 1 is a schematic diagram of a catalyst system installation in an exhaust gas channel of an internal combustion engine; and

— Figure 2 shows a flow diagram of the detection of the state of the catalyst system according to an exemplary embodiment of the process according to the invention.

Page 4, after line 5 insert --DETAILED DESCRIPTION OF THE
PREFERRED EMBODIMENTS--.

In the Claims:

Please cancel claims 1 to 8 and add the following new claims:

--9. A process for detecting a state of a catalyst system installed in an exhaust gas channel of an internal combustion engine of a motor vehicle, through which catalyst system exhaust gas from the internal combustion engine flows so that the exhaust gas can be purified, the process comprising the steps of:

detecting at least one operating parameter of the catalyst system over a predetermined time period;

determining a total energy output of the internal combustion engine within the predetermined time period; and

calculating a characteristic value (k) based on a ratio of the at least one operating parameter to the total energy output.

10. A process according to claim 9, further including forming an average characteristic value (k_m) from a predetermined number n of characteristic values (k).

11. A process according to claim 9, further including generating a maintenance signal as a function of the characteristic value (k).

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12. A process according to claim 10, further including generating a maintenance signal as a function of the average characteristic value (k_m).

13. A process according to claim 11, wherein the maintenance signal generating step includes generating of a maintenance signal when the characteristic value exceeds a predetermined threshold value.

14. A process according to claim 12, wherein the maintenance signal generating step includes generating of a maintenance when the average characteristic value exceeds a predetermined threshold value.

15. A process according to claim 9, wherein the step of determining the total energy output includes finding the total energy output based on a power-equivalent variable.

16. A process according to claim 15, wherein the total energy output is found based on a cumulative air quantity.

17. A process according to claim 9, wherein the at least one operating parameter of the catalyst system comprises a catalyst temperature and an amount of one of the group consisting of HCs, CO, O₂, and NO_x in the exhaust gas.

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18. A process according to claim 9, wherein the predetermined time period occurs within an acceleration phase of the motor vehicle.

19. A process according to claim 9, wherein the process is conducted within at least one of a predetermined lambda region and a predetermined temperature range.--

In the Abstract:

Please cancel the original abstract and insert the attached abstract to the end of the application.

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REMARKS

The present amendment is submitted prior to the issuance of a first Office Action and simultaneously with the filing of the present application.

With this amendment applicants have amended the specification, cancelled claims 1 to 8 and added new claims 9 to 19, all in an effort to place the application in better condition for examination.

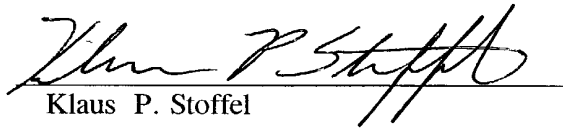
Favorable action on the present application is respectfully requested.

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,

COHEN, PONTANI, LIEBERMAN & PAVANE

By:



Klaus P. Stoffel
Reg. No. 31,668
551 Fifth Avenue, Suite 1210
New York, N.Y. 10176
(212) 687-2770

11 January 2002

In the Specification:

Page 1, starting at line 2:

The invention pertains to a process for detecting the state of a catalyst system in an exhaust gas channel of an internal combustion engine of a motor vehicle [with the features cited in the introductory clause of Claim 1].

Page 2, starting at line 16:

This task is accomplished according to the invention by the process for detecting the state of the catalyst system [with the features cited in Claim 1. In] in that:

- (a) at least one operating parameter of the catalyst system is detected over a predetermined time period;
- (b) the total energy output of the internal combustion engine within the predetermined time period is determined; and
- (c) a characteristic value k is calculated on the basis of a ratio of the at least one operating parameter to the total energy output[.].

[it] It is thus possible in an advantageous manner to take into account the dynamic behavior of the engine with respect to the emission of pollutants.

Page 3, starting at line 19:

In a preferred embodiment of the process, the state of the catalyst system is detected within an acceleration phase of the motor vehicle. In addition, the detection of the state can also be made to depend on whether or not the operating mode of the internal combustion engine is within a predetermined lambda region or on whether the catalyst temperature is in a predetermined temperature range.

the paragraph starting at line 27:

The invention is explained in greater detail below on the basis of the associated drawings:

- Figure 1 is a schematic diagram of a catalyst system installation in an exhaust gas channel of an internal combustion engine; and
- Figure 2 [show] shows a flow diagram of the detection of the state of the catalyst system according to an exemplary embodiment of the process according to the invention.

[illegible]

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WO 01/06,223 A1

PCT/EP00/05,821

PROCESS FOR DETECTING THE STATE OF A CATALYST SYSTEM

The invention pertains to a process for detecting the state of a catalyst system in an exhaust gas channel of an internal combustion engine of a motor vehicle with the features cited in the introductory clause of Claim 1.

It is known that catalysts, especially so-called 3-way catalysts, can be placed in the exhaust gas channel to purify the exhaust gas of the internal combustion engine. When an air-fuel mixture undergoes combustion, pollutants such as soot particles, nitrogen oxides (NO_x), carbon monoxide (CO), and incompletely burned hydrocarbons (HCs) are formed in varying proportions. Reducing agents, i.e., CO, HCs, and H_2 , are oxidized on the catalysts with oxygen and/or nitrogen oxides to form water and carbon dioxide. Oxidizing agents such as NO_x , however, are reduced on the catalysts with the help of reducing agents to form nitrogen.

It is also known that sensors can be assigned to a catalyst system of this type to detect, for example, the percentage of a certain gas component in the exhaust gas (lambda probes, NO_x sensors) or to measure a temperature (temperature sensors). The way in which such sensors function and their location in the catalyst system are known.

During the dynamic operation of an internal combustion engine, the conversion rate for the pollutants deteriorates over the course of time as a result of reversible and irreversible damage to the catalysts. It is therefore known that sensors can be used to detect the degree of damage to the catalyst system, in that, for example, an NO_x emission downstream of the catalyst system is compared with an NO_x emission upstream of the catalyst system. To correct reversible damage, appropriate countermeasures are then usually initiated such

as the regeneration of the catalyst in a reductive atmosphere. When the irreversible damage exceeds a predetermined threshold, it will be necessary under certain conditions to perform expensive maintenance work.

The disadvantage of the known processes is that, during the dynamic operation of the internal combustion engine, especially during acceleration phases, the variables on which the detection of the state of the catalyst system is based fluctuate widely. Thus, during periods of high engine power demand, the NO_x emissions also increase. Thereafter, it is possible for the threshold values for the degree of damage to the catalyst system to be exceeded briefly, even though such severe damage is not actually present. As a result of this incorrect diagnosis, it is possible under certain conditions for unnecessary regeneration or maintenance procedures to be initiated.

The task of the present invention is to provide a way of detecting the state of the catalyst system independently of the dynamic operation of the engine (driving cycle).

This task is accomplished according to the invention by the process for detecting the state of the catalyst system with the features cited in Claim 1. In that:

- (a) at least one operating parameter of the catalyst system is detected over a predetermined time period;
 - (b) the total energy output of the internal combustion engine within the predetermined time period is determined; and
 - (c) a characteristic value k is calculated on the basis of a ratio of the at least one operating parameter to the total energy output,
- it is possible in an advantageous manner to take into account the dynamic behavior of the engine with respect to the emission of pollutants.

To compensate for statistical outliers, it is advantageous to form an average characteristic value from a predetermined number of characteristic val-

ues. As a function of the characteristic value or the average characteristic value, a maintenance signal can then be generated when, for example, a predetermined threshold value is exceeded.

The total energy output of the internal combustion engine can be detected in a manner known in and of itself by the use of suitable sensors and made available by an engine control unit as a measurement signal. To the same end, however, it is also possible to detect variables which are equivalent to the power output such as in particular a cumulative quantity of air. It has been found that a change in the total energy output is associated with a proportional change in selected operating parameters of the catalyst system.

The operating parameters of the catalyst system which are especially suitable include the catalyst temperature and the amount of HCs, CO, O₂, or NO_x in the exhaust gas. These operating parameters can be detected as HC, CO, O₂, or NO_x concentrations by known means with the use of sensors (lambda probes, NO_x sensors) installed in the catalyst system and obtained on the basis of calculated or measured volume flow rates. In the process according to the invention, it is sufficient, for example, to determine the amount of NO_x by means of an NO_x sensor installed downstream of the catalyst.

In a preferred embodiment of the process, the state of the catalyst system is detected within an acceleration phase of the motor vehicle. In addition, the detection of state can also be made to depend on whether or not the operating mode of the internal combustion engine is within a predetermined lambda region or on whether the catalyst temperature is in a predetermined temperature range.

Additional preferred embodiments of the invention can be derived from the other features indicated in the subclaims.

The invention is explained in greater detail below on the basis of the associated drawings:

- Figure 1 is a schematic diagram of a catalyst system installation in an exhaust gas channel of an internal combustion engine; and

- Figure 2 show a flow diagram of the detection of the state of the catalyst system according to an exemplary embodiment of the process according to the invention.

Figure 1 is a schematic diagram of the installation 10 of a catalyst system 12 in an exhaust gas channel 14 of an internal combustion engine 16, in particular a λ -controlled, Otto DI engine. The catalyst system 12 comprises at least one catalyst 18, especially a 3-way catalyst, through which exhaust gas from the internal combustion engine 16 flows. In addition, sensors can also be assigned to the catalyst system 12, which sensors make it possible to detect operating parameters of the catalyst system 12. For example, temperature sensors 24, 25 can be used to detect the exhaust gas temperature or the catalyst temperature. It is also possible to determine the percentages of selected gas components in the exhaust gas by the use of gas sensors. Thus, for example, lambda probes 20, 21 or NO_x sensors 22, 23 can be installed in the exhaust gas channel 14 upstream and downstream of the catalyst 18. The sensors supply measurement data, which can be received and evaluated by an engine control unit 26. The operating mode of the internal combustion engine 16 can be characterized on the basis of a lambda value. Thus, a value of $\lambda > 1$ characterizes operation under lean conditions, whereas $\lambda < 1$ characterizes operation under rich conditions.

During the combustion process of an air-fuel mixture in the internal combustion engine 16, pollutants are formed in varying proportions, which are converted in the catalyst 18 in the course of a conversion reaction. Thus, for example, NO_x is reduced, and CO and HCs are oxidized. The extent to which the conversion reaction takes place in the catalyst 18 can be derived from a conversion rate. This can be determined, for example, by a comparison of a NO_x

value upstream with an NO_x value downstream of the catalyst 18 (by the use of the NO_x sensors 22, 23). The upstream and downstream lambda values of the exhaust gas detected by the lambda probes 20, 21 can be used in a similar manner. The process according to the invention, however, also makes it possible to diagnose the catalyst 18 with the use of only one NO_x sensor 23 installed downstream of the catalyst 18.

If the conversion rate of the catalyst 18 is low, then reversible or irreversible damage to the catalyst can be present. Reversible damage includes, for example, sulfur poisoning, a coating of soot, or the oxidation of the catalyst components. Suitable regeneration measures may be able to repair reversible damage of this kind.

In contrast, irreversible damage, such as that caused by corrosive processes, leads to a permanent decrease in the conversion rate, and when they exceed a certain level must therefore be corrected by maintenance measures.

In the process according to the invention, the operating parameters of the catalyst system 12 are detected by means of the sensors and/or calculated on the basis of suitable models in the known manner. In addition, selected operating parameters of the internal combustion engine 16 are also determined by known means. Thus, a total energy output of the internal combustion engine 16 is acquired over a predetermined period of time. Because the ratio of the at least one operating parameter of the catalyst system 12 to the total energy output behaves in a proportional manner, it is possible to detect the state of the catalyst 18 independently of the engine power by calculating a characteristic value k which reflects this ratio.

Figure 2 is a flow diagram of the detection of the state of the catalyst system 12 according to the process of the invention in an exemplary embodiment. First, it is determined in step S1 whether or not the internal combustion engine 16 of the motor vehicle is just then in an acceleration phase, for

it has been found to be especially advantageous to perform the detection of state procedure during this type of operating phase of the internal combustion engine 16. If an acceleration phase is not present, termination occurs in step S2, which can then be followed in turn by step S1 again.

If the vehicle is in an acceleration phase, it is then determined in step S3 whether or not the catalyst temperature is in a predetermined temperature range. In addition, a lambda value of the exhaust gas must also be within a predetermined lambda range (step S4). If these two conditions are satisfied, the time period of the detection of state is fixed in step S5, and the number n of detection of state procedures is possibly defined also.

As previously explained, the operating parameter of the catalyst system 12 is detected in step S6 with the help of the existing sensors. For this purpose, especially the catalyst temperature and the mass of HCs, CO, CO₂, or NO_x in the exhaust gas are suitable. In addition, the total energy output of the internal combustion engine 16 is also measured over the predetermined time period, either directly or alternatively on the basis of a power-equivalent variable such as a cumulative air quantity.

A ratio of the at least one operating parameter of the catalyst system 12 to the total energy output is used in step S7 to calculate a characteristic value k .

In the exemplary embodiment being discussed here, the determination of the characteristic value is repeated n times to compensate for statistical outliers (step S8), and in step S9, an average characteristic value k_m is formed as the average value of the n characteristic values k . Then, in step S10, the average characteristic value k_m is compared with a predetermined threshold value. If the average characteristic value k_m exceeds the threshold value, it is then possible for a maintenance signal to be generated in step S11, which can be used, for example, for an on-board diagnosis procedure.

CLAIM(S)

1. Process for detecting the state of a catalyst system, where the catalyst system is installed in an exhaust gas channel of an internal combustion engine of a motor vehicle, through which catalyst system exhaust gas from the internal combustion engine flows so that it can be purified, characterized in that

(a) at least one operating parameter of the catalyst system is detected over a predetermined time period;

(b) the total energy output of the internal combustion engine within the predetermined time period is determined; and

(c) a characteristic value (k) is calculated on the basis of a ratio of the at least one operating parameter to the total energy output.

2. Process according to Claim 1, characterized in that an average characteristic value (k_m) is formed from a predetermined number n of characteristic values (k).

3. Process according to Claim 1 or Claim 2, characterized in that a maintenance signal is generated as a function of the characteristic value (k) or of the average characteristic value (k_m).

4. Process according to Claim 3, characterized in that a maintenance signal is generated when the characteristic value (k) or the average characteristic value (k_m) exceeds a predetermined threshold value.

5. Process according to one of the preceding claims, characterized in that the total energy output is found on the basis of a power-equivalent variable, especially a cumulative air quantity.

6. Process according to one of the preceding claims, characterized in that the operating parameters of the catalyst system comprise a catalyst temperature and the amount of HCs, CO, O₂, or NO_x in the exhaust gas.

7. Process according to one of the preceding claims, characterized in that the predetermined time period occurs within an acceleration phase of the motor vehicle.

8. Process according to one of the preceding claims, characterized in that the detection of state is conducted within a predetermined lambda region and/or in a predetermined temperature range.

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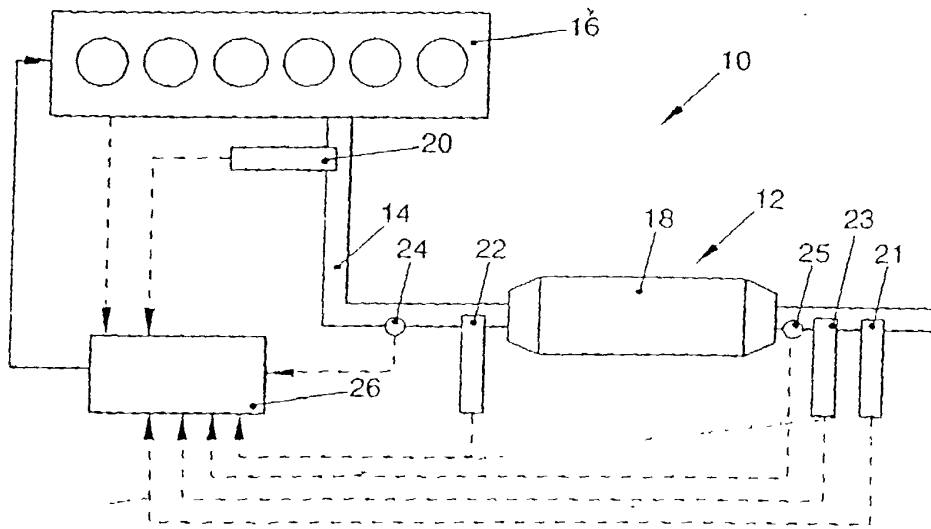


FIG. 1

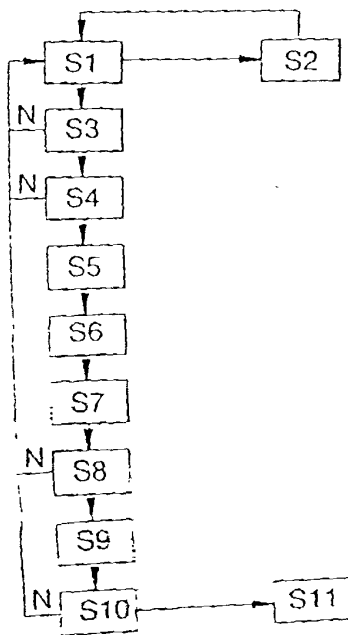


FIG. 2

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

METHOD FOR DETECTING THE STATE OF A CATALYTIC CONVERTER SYSTEM

the specification of which (check only one item below)

☒ is attached hereto

☐ was filed as United States application

Serial No. _

On _

And was amended

On _ (if applicable).

☒ was filed as PCT international application

Number PCT/EP00/05821

On June 23, 2000

And was amended under PCT Article 19

On _ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of the application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

PRIOR FOREIGN/PCT APPLICATIONS AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

Country (if PCT, indicate "PCT")	Application Number	Date of Filing (day, month, year)	Priority Claimed Under 35 U.S.C. 119	
Germany	199 32 715.7	July 16, 1999	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
PCT	PCT/EP00/05821	June 23, 2000	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS (check one)		
U S APPLICATION NUMBER	U S FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO	PCT FILING DATE	U.S SERIAL NUMBERS ASSIGNED (if any)		
PCT/EP00/05821	June 23, 2000		X	

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (*List name and registration number*)

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201	FULL NAME OF INVENTOR <u>1-00</u>	FAMILY NAME <u>LANG</u>	FIRST GIVEN NAME <u>Axel</u>	SECOND GIVEN NAME
	RESIDENCE CITIZENSHIP	CITY <u>Wolfenbüttel</u>	STATE OR FOREIGN COUNTRY <u>Germany</u>	COUNTRY OF CITIZENSHIP <u>Germany</u> DEX
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>Nelkenweg 29</u>	CITY <u>Wolfenbüttel</u>	STATE & ZIP CODE/COUNTRY <u>Germany D-38302</u>
202	FULL NAME OF INVENTOR <u>2-00</u>	FAMILY NAME <u>WACHTENDORF</u>	FIRST GIVEN NAME <u>Axel</u>	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY <u>Hude</u>	STATE OR FOREIGN COUNTRY <u>Germany</u>	COUNTRY OF CITIZENSHIP <u>Germany</u> DEX
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>Vielstedter Strasse 16</u>	CITY <u>Hude</u>	STATE & ZIP CODE/COUNTRY <u>Germany D-27798</u>

(Includes Reference to PCT International Applications)

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203	FULL NAME OF INVENTOR <u>3-00</u>	FAMILY NAME <u>KAMMANN</u>	FIRST GIVEN NAME <u>Uwe</u>	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY <u>Warberg</u>	STATE OR FOREIGN COUNTRY <u>Germany</u>	COUNTRY OF CITIZENSHIP <u>Germany DEX</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>Am Kirchberg 1</u>	CITY <u>Warberg</u>	STATE & ZIP CODE/COUNTRY <u>Germany D-38378</u>
204	FULL NAME OF INVENTOR <u>4-00</u>	FAMILY NAME <u>LOECK</u>	FIRST GIVEN NAME <u>Harald</u>	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY <u>Wolfsburg</u>	STATE OR FOREIGN COUNTRY <u>Germany</u>	COUNTRY OF CITIZENSHIP <u>Germany DEX</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>Auetichstrasse 27</u>	CITY <u>Wolfsburg</u>	STATE & ZIP CODE/COUNTRY <u>Germany D-38442</u>
205	FULL NAME OF INVENTOR <u>5-00</u>	FAMILY NAME <u>KREBS</u>	FIRST GIVEN NAME <u>Rudolf</u>	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY <u>Wendeburg</u>	STATE OR FOREIGN COUNTRY <u>Germany</u>	COUNTRY OF CITIZENSHIP <u>Germany DEX</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>Peiner Strasse 96</u>	CITY <u>Wendeburg</u>	STATE & ZIP CODE/COUNTRY <u>Germany D-38176</u>
206	FULL NAME OF INVENTOR <u>6-00</u>	FAMILY NAME <u>DAETZ</u>	FIRST GIVEN NAME <u>Michael</u>	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY <u>Tiddische</u>	STATE OR FOREIGN COUNTRY <u>Germany</u>	COUNTRY OF CITIZENSHIP <u>Germany DEX</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>An der Strausche 8</u>	CITY <u>Tiddische</u>	STATE & ZIP CODE/COUNTRY <u>Germany D-38473</u>
207	FULL NAME OF INVENTOR <u>7-00</u>	FAMILY NAME <u>WITTIG</u>	FIRST GIVEN NAME <u>Frank</u>	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY <u>Braunschweig</u>	STATE OR FOREIGN COUNTRY <u>Germany</u>	COUNTRY OF CITIZENSHIP <u>Germany DEX</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>Ellernbruch 10</u>	CITY <u>Braunschweig</u>	STATE & ZIP CODE/COUNTRY <u>Germany D-38112</u>
208	FULL NAME OF INVENTOR <u>8-00</u>	FAMILY NAME <u>KÖNIG</u>	FIRST GIVEN NAME <u>Axel</u>	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY <u>Wolfsburg</u>	STATE OR FOREIGN COUNTRY <u>Germany</u>	COUNTRY OF CITIZENSHIP <u>Germany DEX</u>
	POST OFFICE ADDRESS	POST OFFICE ADDRESS <u>Galgenkamp 13</u>	CITY <u>Wolfsburg</u>	STATE & ZIP CODE/COUNTRY <u>Germany D-38448</u>

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201 <i>[Signature]</i>	SIGNATURE OF INVENTOR 202 <i>[Signature]</i>	SIGNATURE OF INVENTOR 203 <i>[Signature]</i>
DATE 31.01.02	DATE 12/20/2001	DATE 12/18/2001
SIGNATURE OF INVENTOR 204 <i>[Signature]</i>	SIGNATURE OF INVENTOR 205 <i>[Signature]</i>	SIGNATURE OF INVENTOR 206 <i>[Signature]</i>
DATE 12.18.2001	DATE 2002-01-18	DATE 2001-12-18
SIGNATURE OF INVENTOR 207 <i>[Signature]</i>	SIGNATURE OF INVENTOR 208 <i>[Signature]</i>	
DATE 22.01.02	DATE 12/18/2001	